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REMARKS

This is a preliminary amendment in which the Applicant has eliminated multiple dependencies.

A favorable first action is respectfully requested.

If, for any reason, the Examiner is of the opinion that a telephone conversation with the Applicant's representative would expedite prosecution, the Examiner is invited to contact the undersigned at 617-573-7851.

Respectfully submitted,

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Docket No.: M0925/7067 TJO
Date: September 13, 2001

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MARKED-UP CLAIMS

8. (Amended) The system [or method of any] of claim[s] 1, [4, or 5] wherein said polymeric species containing an inorganic species capable of forming a ceramic oxide comprises a silicon-containing polymeric species.

9. (Amended) The system [or method of any] of claim[s] 2, [6, or 7] wherein said polymerized monomer containing an inorganic species capable of forming a ceramic oxide comprises a silicon-containing polymeric species.

10. (Amended) The system [or method of any] of claim[s 1,] 2, [4-7] wherein the polymeric article includes a polymeric material self-assembled into a periodic structure of a plurality of periodically occurring separate domains, comprising at least the first and the second domain.

11. (Amended) The system [or method of any] of claim[s] 1, [4, or 5] wherein said second domain comprises a polymeric species not containing a sufficient quantity of inorganic species to be capable of forming a ceramic oxide.

14. (Amended) The system [or method of any] of claim[s] 2, [6, 7, or 11,] wherein said second domain at least partially comprises void space formed by at least partial removal of the polymeric species not containing a sufficient quantity of inorganic species to be capable of forming a ceramic oxide from the periodic structure.

15. (Amended) The system [or method] of claim 14, wherein said first domain includes an inorganic oxide ceramic formed by oxidation of the polymeric species containing an inorganic species.

16. (Amended) The system [or method of any] of claim[s] 1, [4, or 5] wherein said polymeric species containing an inorganic species capable of forming a ceramic oxide is comprised of a polymerized monomer, the monomer containing an inorganic species capable of forming a ceramic oxide.

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17. (Amended) The system [or method of any] of claim[s 1,] 2, [4-7, or 12] wherein the first and second domains of the polymeric article comprise a block copolymeric species having at least two blocks A and B that are assembled into the first and second domains respectively.

18. (Amended) The system [or method] of claim 17, wherein the block copolymeric species has at least three blocks A, B, and C.

19. (Amended) The system [or method] of [any preceding] claim 2, wherein at least one domain further contains an auxiliary component.

20. (Amended) The system [or method] of claim 19, wherein said auxiliary component modifies the volume fraction of the domain in which it is present.

21. (Amended) The system [or method] of claim 20, wherein said auxiliary component is a homopolymeric species.

22. (Amended) The system [or method] of claim 19, wherein said auxiliary component is a particulate.

23. (Amended) The system [or method of any] of claim[s] 1, [3-5] wherein said polymeric species has a glass transition temperature of at least about 0 degrees C.

24. (Amended) The system [or method] of claim 1, [3-5,] wherein the polymeric species comprise polymers having an average molecular weight of at least about 30,000 Da.

25. (Amended) The system [or method of any preceding] claim 2, wherein the polymeric species comprise polymers having a polydispersity of no more than two.

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26. (Amended) The system [or method] of claim[s] 3 [or 14], wherein said second domain is subsequently at least partially filled with a material that cannot be formed into a periodic structure by self-assembly.

27. (Amended) The system [or method] of claim[s] 3 [or 14], wherein said void space is made electrically conducting, thus creating a conducting network.

28. (Amended) The system [or method] of claim[s] 3 [or 14], wherein the article has at least a first side and a second side with at least one void space providing a continuous pathway for fluid communication between said first side and said second side so that the article functions as a membrane.

29. (Amended) The method of claim[s 5 or] 7, comprising allowing the block copolymeric species to self-assemble into the phase separated polymeric multi-domain periodic structure.

31. (Amended) The [system, method, or] article [of any] of claim[s 2, 3, 6, 7, or] 30, wherein the article has an at least three-dimensionally periodic structure.

32. (Amended) The [system, method, or] article of claim[s 26 or] 30, wherein said material is a polymer that cannot be formed into a periodic structure by self-assembly.

33. (Amended) The [system, method, or] article of claim 32, wherein said polymer that cannot be formed into a periodic structure by self-assembly is a fluorine-containing polymer.

34. (Amended) The [system, method, or] article of claim 33, wherein said polymer that cannot be formed into a periodic structure by self-assembly is poly(tetrafluoroethylene).

35. (Amended) The [system, method, or] article of claim[s 26 or] 30 wherein said material is a conducting polymer.

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36. (Amended) The [system, method, or] article of claim[s 26 or] 30, wherein said material is a metal.

37. (Amended) The [system, method, or] article of claim 36, wherein said metal is a liquid having a melting temperature of at least about 400 degrees C.

38. (Amended) The [system, method, or] article of claim[s 26 or] 30, wherein said material is a material having a dielectric constant greater than three.

39. (Amended) The [system, method, or] article of claim[s 26 or] 30, wherein said material is a magnetic material.

40. (Amended) The [system, method, or] article of claim 39, wherein said magnetic material is disposed on the surface of a substrate.

41. (Amended) The system[, method, or article] of [any preceding] claim 2, wherein the structure has a photonic band gap in at least one direction for electromagnetic radiation of at least one wavelength within the range of about 20 nm to about 1 μm.

42. (Amended) The [system, method, or] article of [any preceding] claim 30, wherein the article has an at least one-dimensionally periodic structure.

43. (Amended) The [system, method, or] article of [any preceding] claim 30, wherein the article has an at least two-dimensionally periodic structure.

49. (Amended) The [membrane,] mold[, or method of any]of claim[s 46-48] 47, wherein said void spaces have a characteristic minimum dimension of between 1 nm and 1 μm.

52. (Amended) The [membrane,] mold[, or method of any] of claim[s 46-48] 47, wherein said inorganic oxide ceramic is comprised of an oxidized silicon-containing polymeric species.

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55. (Amended) The membrane[, mold, or method of any] of claim[s] 46[-48], wherein the structure is one-dimensionally periodic.

56. (Amended) The membrane[, mold, or method of any] of claim[s] 46[-48], wherein the structure is two-dimensionally periodic.

57. (Amended) The membrane[, mold, or method] of claim 56, wherein said void spaces are in the shape of essentially circular cylinders.

58. (Amended) The membrane[, mold, or method] of claim 57, wherein said void spaces are non-overlapping and non-intersecting.

59. (Amended) The [membrane,] mold[, or method of any] of claim[s 46-48] 47, wherein the structure is three-dimensionally periodic.

60. (Amended) The [membrane,] mold[, or method] of claim 59, wherein said void spaces form an interconnected continuous network of pathways within said structure having a plurality of nodes.

61. (Amended) The [membrane,] mold[, or method] of claim 60, wherein said void spaces are made conducting, thus forming a conducting network.

81. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to a chemical oxidizer.

85. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to radiation.

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87. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to oxygen plasma etching.

89. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to a combination of a chemical oxidizer and radiation.

90. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to a combination of a chemical oxidizer and oxygen plasma etching.

91. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to a combination of a radiation and oxygen plasma etching.

92. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to an electron beam.

93. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to heat.

94. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to a base.

95. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the removing step includes exposing the article to a solvent.

96. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the oxidizing step includes exposing the article to a chemical oxidizer.

100. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the oxidizing step includes exposing the article to radiation.

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102. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the oxidizing step includes exposing the article to oxygen plasma etching.

104. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the oxidizing step includes exposing the article to a combination of a chemical oxidizer and radiation.

105. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the oxidizing step includes exposing the article to a combination of a chemical oxidizer and oxygen plasma etching.

106. (Amended) The method [of any] of claim[s] 69, [78-80,] wherein the oxidizing step includes exposing the article to a combination of a radiation and oxygen plasma etching.

113. (Amended) The method of claim[s] 110 [or 111], further comprising before the adding step:

at least partially oxidizing the structure to form an inorganic oxide.

114. (Amended) The method of claims 111 [or 112], further comprising:

removing the article from the substrate, while leaving behind on the substrate at least a portion of the magnetic material.

115. (Amended) The method of claim[s] 111 [or 112], wherein the forming step comprises:

providing the substrate;

coating the substrate with a polymeric layer; and

converting the layer into said polymeric article.

116. (Amended) The method of claim 111 [or 112], wherein the forming step comprises:

providing the substrate; and

attaching said polymeric article to the substrate.

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117. (Amended) The method of claim[s] 110 [or 111], wherein at least one domain of the polymeric article is at least partially oxidized during the removing step.

119. (Amended) The method of claim[s] 110 [or 111], wherein the polymeric article has an at least one-dimensionally periodic structure.

120. (Amended) The method of claim[s] 111 [or 112], wherein the polymeric article has an at least two-dimensionally periodic structure.

121. (Amended) The method of claim[s] 110 [or 111], wherein the polymeric article has a three-dimensionally periodic structure.

122. (Amended) The method of claim[s] 110 [or 111], wherein domains that are at least partially removed during the removing step are non-interconnected.

123. (Amended) The method of claim[s] 111 [or 112], wherein during the adding step, the magnetic material is deposited into the void space by electrodeposition.

125. (Amended) The method of claim[s] 110 [or 111], wherein during the adding step, the magnetic material is deposited into the void space by vapor deposition.

135. (Amended) The article of claim[s 133 or] 134, wherein the at least one domain including a magnetic material is at least partially surrounded by void space.

136. (Amended) The article of claim[s 133 or] 134, wherein the at least one domain including a magnetic material is at least partially surrounded by a polymeric material.

137. (Amended) The article of claim[s 133 or] 134, wherein the at least one domain including a magnetic material is at least partially surrounded by an inorganic oxide ceramic.

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138. (Amended) The article of claim[s 133 or] 134, further comprising a substrate in contact with a surface of the at least one domain including a magnetic material.

140. (Amended) The article of claim[s 133 or] 134, wherein the at least one domain including a magnetic material has a characteristic dimension between about 10 nm and about 50 nm.

141. (Amended) The article of claim[s 133 or] 134, wherein domains including a magnetic material are separated from each other by a minimum distance of between about 1 nm and about 20 nm.

142. (Amended) The article of claim[s 133 or] 134, wherein the at least one domain including a magnetic material consists essentially of the magnetic material.

143. (Amended) The article of claim[s 133 or] 134, wherein the magnetic material is selected from at least one of cobalt, nickel, iron, alloys of cobalt and platinum, alloys of cobalt and iron, oxides thereof, and barium ferrite.